Using Deep Learning for PCB Fault Detection

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Abstract: *Electronic components are mainly connected to one another using printed circuit boards, or PCBs. This phase holds significant importance in the production of electronic goods. The finished product may become unusable due to a minor PCB flaw. As a result, throughout the PCB manufacturing process, rigorous and thorough flaw identification procedures are essential. To guarantee the dependability and performance of electronic products, quality control and assurance procedures are essential in the electronics manufacturing process, especially when producing printed circuit boards (PCBs). Conventional inspection techniques are not always effective in locating different kinds of PCB flaws. Defect identification is essential to guaranteeing the dependability and functionality of electronic products since printed circuit boards, or PCBs, are essential parts of electronic gadgets. Conventional approaches to PCB defect detection, like manual inspection or traditional image processing methods, are frequently laborious, imprecise, and prone to human error. This research suggests utilizing the YOLOv5 model, a cutting-edge deep learning-based object detection technique, to create an automated PCB flaw detection system in order to overcome these difficulties.*

Keywords: PCB; flaw; identification; in-depth knowledge.